

WE CLAIM:

5001

1. A condenser comprising:
 - a top manifold defining a first volume of space;
 - 5 a bottom manifold positioned below said top manifold and defining a second volume of space that has a magnitude that is different than the magnitude of said first volume of space;
 - a core positioned between said top manifold and said bottom manifold, said core comprising:
 - 10 a first set of condenser tubes that are in fluid communication with said top manifold and said bottom manifold; and
 - a second set of condenser tubes that are in fluid communication with said top manifold and said second bottom manifold.
- 15 2. The condenser of claim 1, wherein said top manifold comprises a partition that divides said manifold into an upper chamber that is in fluid communication with said first set of condenser tubes and a lower chamber that is in fluid communication with said second set of condenser tubes.
- 20 3. The condenser of claim 1, wherein said second set of condenser tubes are supercooling tubes.

20140101 062900T

4. The condenser of claim 3, wherein the number of said first set of condenser tubes is greater than the number of said second set of condenser tubes.

5. The condenser of claim 1, further comprising corrugated fins attached to said first set of condenser tubes.

6. The condenser of claim 1, further comprising a refrigerant within said first set of condenser tubes and said second set of condenser tubes.

7. The condenser of claim 1, wherein said magnitude of said second volume of space is greater than said magnitude of said first volume of space.

8. The condenser of claim 1, wherein said bottom manifold further comprises a depression.

201610-062900T

9. An air conditioning system comprising:

a moving vehicle comprising:

an engine;

a radiator positioned so as to cool said engine;

a condenser mounted to said moving vehicle so as to be positioned in front of said radiator, said condenser comprising:

a top manifold defining a first volume of space;

a bottom manifold positioned below said top manifold and defining a second volume of space that has a magnitude that is different than the magnitude of said first volume of space;

a core positioned between said top manifold and said bottom manifold, said core comprising:

a first set of condenser tubes that are in fluid communication with said top manifold and said bottom manifold; and

a second set of condenser tubes that are in fluid communication with said top manifold and said bottom manifold.

10056290 013102

5
a

10

15

10. The air conditioning system of claim 9, wherein said top manifold comprises a partition that divides said manifold into an upper chamber that is in fluid communication with said first set of condenser tubes and a lower chamber that is in fluid communication with said second set of condenser tubes.

11. The air conditioning system of claim 10, wherein said second set of condenser tubes are supercooling tubes.

12. The air conditioning system of claim 11, wherein the number of said first set of condenser tubes is greater than the number of said second set of condenser tubes.

13. The air conditioning system of claim 9, further comprising corrugated fins attached to said first set of condenser tubes .

14. The air conditioning system of claim 9, further comprising a refrigerant within said first set of condenser tubes and said second set of condenser tubes.

201606290.013102

15. The air conditioning system of claim 9, wherein said magnitude of said second volume of space is greater than said magnitude of said first volume of space.

16. The air conditioning system of claim 9, wherein said bottom manifold further comprises a depression.

17. The air conditioning system of claim 14, further comprising a compressor that transmits said refrigerant to said condenser.

18. The air conditioning system of claim 17, further comprising an expansion valve that receives said refrigerant from said condenser.

201605290-013102

5

10

19. A condenser comprising:
- a first manifold defining a first volume of space;
 - a second manifold defining a second volume of space
- 5 that has a magnitude that is substantially the same as the magnitude of said first volume of space;
- a core positioned between said first manifold and said second manifold, said core comprising:
- a first set of condenser tubes that are in fluid
- 10 communication with said first manifold and said second manifold; and
- a second set of condenser tubes that are in fluid communication with said first manifold and said second manifold, wherein a refrigerant is present in a gas phase and liquid phase within said first set of condenser tubes and said second set of condenser tubes, said liquid phase is
- 15 contained exclusively within said first set of condenser tubes and said second set of condenser tubes irrespective of the thermodynamic conditions within said condenser.
20. The condenser of claim 19, wherein said condenser is a
- 20 cross-flow condenser.
21. The condenser of claim 19, wherein said condenser is a downflow condenser.

202506290.013102

22. The condenser of claim 19, wherein said second set of condenser tubes are supercooling tubes.

23. The condenser of claim 22, wherein the number of said first set of condenser tubes is greater than the number of said second set of condenser tubes.

24. The condenser of claim 19, further comprising corrugated fins attached to said first set of condenser tubes.

2015-06-29 10:01:31

5

AI

25. An air conditioning system comprising:

a moving vehicle comprising:

an engine;

a radiator positioned so as to cool said engine;

a condenser mounted to said moving vehicle so as to be positioned in front of said radiator, said condenser comprising:

a first manifold defining a first volume of space;

a second manifold defining a second volume of space that has a magnitude that is substantially the same as the magnitude of said first volume of space;

a core positioned between said first manifold and said second manifold, said core comprising:

a first set of condenser tubes that are in fluid communication with said first manifold and said second manifold; and

a second set of condenser tubes that are in fluid communication with said first manifold and said second manifold,

wherein a refrigerant is present in a gas phase and liquid phase within said first set of condenser tubes and said second set of condenser tubes, said liquid phase is contained exclusively within said first set of condenser tubes

10065290.013102

and said second set of condenser tubes irrespective of the thermodynamic conditions within said condenser.

26. The condenser of claim 25, wherein said condenser is a cross-flow condenser.

27. The condenser of claim 25, wherein said condenser is a downflow condenser.

28. The air conditioning system of claim 25, wherein said top manifold comprises a partition that divides said manifold into an upper chamber that is in fluid communication with said first set of condenser tubes and a lower chamber that is in fluid communication with said second set of condenser tubes.

29. The air conditioning system of claim 25, wherein said second set of condenser tubes are supercooling tubes.

30. The air conditioning system of claim 29, wherein the number of said first set of condenser tubes is greater than the number of said second set of condenser tubes.

10066290-013102

31. The air conditioning system of claim 25, further comprising corrugated fins attached to said first set of condenser tubes.

an
5

32. The air conditioning system of claim 25, further comprising a compressor that transmits said refrigerant to said condenser.

33. The air conditioning system of claim 32, further comprising an expansion valve that receives said refrigerant from said condenser.